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The Center for Food Safety is a national non-profit membership organization committed to protecting human health and the environment by promoting organic agriculture and other sustainable practices. CFS engages in legal initiatives, grassroots mobilizations, and education programs designed to influence government and industry and to inform the public on such issues as genetic engineering, food irradiation, and organic food standards.

Genetically Engineered Foods and the Environment: A Catastrophe in the Making

The term "pollution" evokes thoughts of factory smokestacks capped by billowing columns of acrid smoke or lifeless streams foaming with putrid agricultural or industrial runoff. For decades environmentalists have focused on reducing or eliminating these and other forms of chemical pollution. Now, the commercialization of biotechnology has raised concerns among scientists, farmers, and the public over a much more subtle yet potentially more insidious form of pollution—the biological contamination of wild species, organic crops, and other agricultural products.

Unlike chemical pollutants, biological pollutants reproduce, disseminate, and mutate. They do not degrade over time as chemicals do, but rather multiply exponentially. Disastrous U.S. experiences with exotic bio-invaders such as Dutch elm disease, chestnut blight, and the kudzu vine attest to the pernicious problem of biological pollution. As demonstrated by these exotics, once biological or genetic pollutants enter the environment, the results are irreversible and ecosystems are forever changed.

Genetic pollution, unlike a molecule of DDT, may reproduce itself and spread throughout the environment, frustrating all of our efforts to contain it.

Plant geneticist Dr. Norman C. Ellstrand describes the difference between chemical and biological pollution: "A single molecule of DDT remains a single molecule or degrades, but a single crop [gene] has the opportunity to multiply itself repeatedly through reproduction, which can frustrate attempts at containment."[1]

Even as agricultural biotechnology brings with it an unprecedented increase in potential biological pollution, its current uses are also likely to increase the use of agricultural chemicals.

SUPERWEEDS

A major biological pollution problem of genetically engineered crops is the creation of "superweeds." Almost all of the world's leading food crops have formed hybrids in nature with weedy relatives.[2] Published research confirms varying degrees of gene flow from domesticated crops to weedy wild relatives for varieties of beets, canola, corn, grapes, millet, radishes, rice, squash, and sunflowers. Several studies demonstrate that GE plants are likely to share this propensity, and some may have a strong tendency to pass along traits that could create more persistent, more damaging weeds.[3]

One example of such research is a two-year trial on plant/weed hybridization conducted by Dr. Ellstrand and Dr. Paul E. Arriola of the University of California, Riverside. The trial demonstrated substantial hybridization between sorghum and johnsongrass, a noxious weed that plagues various field and orchard crops. Extreme johnsongrass infestation can reduce corn, cotton, and soybean yields by nearly half. Arriola and Ellstrand found sorghum/johnsongrass hybrids growing as far as 100 meters from the nearest sorghum crop, and judged these plants to be as hearty as non-hybrid johnsongrass. The researchers' summary of their findings includes a warning: "Transgenes introduced into sorghum can be expected to have the opportunity to escape cultivation through inter-

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specific hybridization with johnsongrass. Traits that prove to be beneficial to weeds possessing them can be expected to persist and spread."[4]

Crops engineered to tolerate herbicides are of particular concern. Currently 79% of all genetically engineered crops grown in the U.S. have been altered to be herbicide resistant. Scientists fear that the genes creating tolerance to herbicides will jump from engineered crops to weeds, making the weeds virtually impossible to eradicate. The biotechnology industry has long known of the potential for its crops to create superweeds. In fact, scientists at Calgene, the company that introduced the first commercial GE crop, were among the earliest to predict this danger. They noted in 1985, "The sexual transfer of genes to weedy species to create a more persistent weed is probably the greatest environmental risk of planting a new variety of crop species."[5] Since that time, field trials and the experiences of commercial growers have borne out their fears.

Besides hybridizing with weeds, genetically engineered crops themselves can become superweeds. Once again the major concern is herbicide-resistant plants. In the late 1990s, canola farmers in Alberta, Canada, began planting three distinct types of GE seeds specifically designed to withstand the application of certain commercial pesticides. One variety exhibited resistance to Monsanto Co.'s Roundup herbicide, another to Aventis LP's Liberty herbicide, and another to Cyanamid's Pursuit and Odyssey herbicides. By early 2000, all of these varieties had cross-pollinated to the extent that farmers were finding triple-resistant canola, exhibiting the resistance traits of all three GE varieties, growing in and around their fields.[6]

Conventional "volunteer" canola—self-perpetuating canola not intentionally sewn—has already emerged as a troublesome weed common to Canadian wheat and barley fields.[7] With the spread of canola that is resistant to multiple herbicides, farmers who stake their livelihoods on growing wheat and barley are likely to find that controlling volunteer canola has become more difficult. In the words of the Royal Society of Canada, "[GE herbicide-resistant] volunteer canola could become one of Canada's most serious weed problems."[8]

Superweeds are likely to become ever more problematic as different genes are engineered into food crops. The Royal Society of Canada reports that as genetic engineering becomes more sophisticated, the task of controlling cross-pollinated weeds or volunteer crops may become nearly impossible. Brian Ellis of the University of British Columbia and co-chair of the Royal Society's biotechnology panel notes, "The next generation [of GE plants] is crops … carrying genes that make them more frost-tolerant or drought-tolerant."[9] Adding these novel survival traits to weeds and GE crops, many already herbicide-resistant, is a prescription for environmental disaster.

Genetic Contamination

Superweeds are not the only consequence of unwanted gene-flow. Volunteer crops, cross pollination, and poorly segregated seed stocks have led to widespread contamination of non-engineered crops. This is potentially devastating for organic farmers and others wishing to keep their crops free from GE contamination. The pervasiveness of genetic contamination effectively denies farmers and consumers the ability to choose to avoid growing and eating GE crops and foods.

In 2001, U.S. farmers expected to grow over 76 million acres of GE corn, soybeans, and upland cotton.[10] The proliferation of GE varieties has ensured that contamination of non-GE crops, either through cross-pollination or the failure to properly segregate seeds and harvests, is rampant. David Gould, who serves on organic certification committees in California and North Dakota, reported early last year that "investigations thus far from the 2000 harvest lead us to believe that virtually all the seed corn in the United States is contaminated with at least a trace of genetically engineered material, and often more. Even the organic lots are showing traces of biotech varieties."[11] Controlling the spread of GE contamination has proven all but impossible.

StarLink

The highly publicized StarLink case vividly demonstrates the biological contamination problem. In 1998, the EPA allowed cultivation of the StarLink variety of yellow corn, genetically engineered by Aventis to include the Cry9C protein, which is toxic to some insect pests. However, EPA mandated that StarLink be used only in livestock feed and industrial applications, because Cry9C is difficult for humans to digest and may pose allergy risks for some people.[12]

Two years later, Genetically Engineered Food Alert, a coalition of groups including CFS, announced that an independent laboratory had discovered residues of the Cry9C DNA sequence in taco shells made by Kraft Foods.[13] Eventually, StarLink corn turned up in a wider variety of processed foods, and Aventis estimated that some 50 million bushels of non-StarLink corn had been contaminated. According to David Gould, a mere 1% of Iowa corn fields were sewn with StarLink, but harvests from about half of the state's fields showed at least a trace of StarLink contamination.[14] In April 2001, Aventis admitted the obvious: its initial assumptions that growers and crop processors could keep StarLink segregated from other varieties were completely unfounded. The company wrote in a filing with the EPA:

> The grain handlers, food industry and Aventis have undertaken extraordinary measures to prevent corn containing Cry9C protein from entering the food supply. In spite of these efforts,

> trace levels of Cry9C will continue to be unavoidably present in grain. Moreover, it is now understood that it was inevitable that the commercial introduction of StarLink corn for feed use would cause the introduction of Cry9C protein into the general grain supply because of the biology of corn, gene flow and the processes used in grain handling.[15]

While Aventis hoped its filing would convince EPA to set acceptable tolerance levels for its unapproved variety of corn in our food supply, the statement above unwittingly articulates an argument opponents of GE crops have made for more than a decade. Once unleashed, genetic pollution is impossible to control, even if we employ "extraordinary measures" aimed at preventing its spread.

The Oaxaca Invasion

Genetic contamination can also seriously undermine attempts to protect native plant species. In October 2000, scientists at an isolated research center in the state of Oaxaca, Mexico, made a surprising discovery—samples of "criollo" maize, one of the world's oldest corn varieties, contained engineered genetic material. The discovery was unexpected because Mexico enacted a moratorium on the cultivation of GE corn in 1998, a policy specifically designed to protect native varieties such as the criollo. Further tests revealed transgenic hybrids of native corn varieties growing in 15 of 22 villages in the area. Where contamination was found, 3% to 10% of the plants were affected.[16]

The GE corn invasion of Oaxaca could carry serious ramifications. Oaxaca is known as the center of origin for corn, and many corn breeders use the rich genetic resources of the region's plants to develop new commercial varieties through traditional crossbreeding. Local agriculture officials fear that the influx of GE corn may force out older varieties, and significantly reduce the region's treasured biodiversity.[17]

BEYOND GENE FLOW

Bacillus thuringiensis (*Bt*) is a family of bacteria that serves as a natural pesticide, because its various subspecies produce proteins (such as Cry9C) toxic to a variety of crop pests. Typically, *Bt* degrades quickly and poses few toxicity risks to humans, wildlife, or beneficial insects. Therefore, it has become a favored low-impact pesticide for occasional agricultural use. Because *Bt* is not a manmade pesticide, it is particularly important to organic farmers.

Genetically engineered *Bt* crops constantly produce an activated form of *Bt* toxin. A published study on *Bt* cotton states, "This system amounts to a continuous spraying of an entire plant with the toxin, except for the application is from the inside out."[18] Not surprisingly, concentrations of protein toxins are much higher in the tissues of *Bt* crops than in sprays that farmers apply topically.[19]

Non-target Insects

Crops engineered to produce *Bt* toxins or other insecticides are likely to affect a variety of insects, including those that are not crop pests. A highly publicized study led by Dr. John E. Losey of Cornell University determined that pollen from *Bt* corn can dust milkweed leaves near cornfields and reduce the survival rate of monarch butterfly larvae that feed on the milkweed.[20] Some scientists have challenged the so-called “monarch study,” arguing that Losey's results in a controlled experiment do not translate to real-world settings.[21]

Crops engineered to constantly produce Bt toxins will likely promote Bt-resistance in a variety of crop pests, destroying the usefulness of this natural pesticide for organic farmers.

Subsequent research, however, suggests that natural dusting of milkweed by *Bt* corn pollen can indeed reduce the survival of monarch larvae up to 10 meters from the edge of a GE cornfield.[22] A study involving Novartis’ Event 176 varieties of *Bt* corn found that they interfered with the normal development of the non-target black swallowtail. Syngenta, formed by the 2000 merger of Novartis and Zeneca Agrochemicals, has agreed to remove Event 176 corn varieties from the market by 2003.[23]

Research into how *Bt* crops' toxicity to non-target insects affects wider ecosystems is incomplete. For example, it is uncertain whether high levels of *Bt* produced by GE crops could have a counterproductive effect by killing beneficial insects and parasites that naturally reduce crop pests. One study found that *Bt* Cry1Ab toxin is harmful to the green lacewing, a beneficial predator that feeds on aphids.[24] While non-target butterflies and moths affected by *Bt* corn do not prey on crop pests, they do feed on weedy plants, function as pollinators, and sustain populations of beneficial predators by providing an additional food source. Non-target insects also serve as prey for birds and bats. One study found spraying forests with conventional *Bt* toxin impacted the food supply of the black-throated blue warbler, resulting in reduced breeding activity by the birds and causing their rate of reproduction to fall below their rate of mortality.[25]

Bt Resistance

Widespread adoption of *Bt* crops could hasten the evolution of pests resistant to *Bt*. Cornell University researchers found that after exposure for 24 generations diamondback moths feeding on a *Bt* broccoli variety acquired sufficient resistance for the entire group to complete its full lifecycle feeding on the GE plants.[26] Field studies on commercial *Bt* crops have not found insect resistance to *Bt*, but the studies are far from comprehensive or conclusive.

Most researchers and farmers consider *Bt* resistance a serious threat. Dr. Theo Wallimann of the Institute of Cell Biology in Zurich, Switzerland, wrote in a letter to the journal *Science*:

> The real issue is that a strategy to constitutively express an insecticidal compound in large-scale crop monocultures … and thus expose a homogeneous subecosystem continuously to the toxin, seems bound to create *Bt*-toxin-resistant pests because of heavy selection pressure. Sooner or later we will likely see *Bt*-toxin resistance in those insects that are constantly in contact with these monocultures and feed on them. If or when this occurs, we will have lost a valuable bio-insecticide. For about 30 years *Bt* toxin has been applied on the spot … and only when there are signs of infestation of the crops by insects. It is the most successful biological insecticide control system we have and would probably retain its potency against pests for many more years to come.[27]

The primary strategy for preventing *Bt* resistance relies on planting refuges—sections of fields growing non-*Bt* crops in proximity to the *Bt* varieties. The theory is that pests attacking the refuge crops will mate with those feeding on the *Bt* crops and prevent resistance from being passed to the next generation. There are two potentially critical flaws in this strategy. First, it seems unlikely that farmers will maintain sufficient refuge fields close enough to all of their *Bt* fields to ensure cross-breeding between the various pest populations. A CFS analysis of industry and EPA surveys reveals that over 30% of StarLink growers may not have complied with regulations designed to prevent resistance in pests.[28] Second, the refuge strategy will only work if *Bt* resistance is a recessive genetic trait, that is, one that must be inherited from both parents to be expressed. Research in this area is lacking, but scientists have determined that in at least one important crop pest, the European corn borer, *Bt* resistance is a dominant trait, meaning that only one parent need pass along the *Bt*-resistance gene for it to be expressed in the offspring.[29] This would presumably defeat the refuge strategy.

The rise of *Bt* resistance would have an extreme impact on many organic farmers. Some 18% of organic growers use low-impact *Bt* sprays "frequently or regularly," while another 27% use them "on occasion" and 12% rely on them as a "last resort."[30] Without *Bt*, many of these farmers would suffer greater crop losses or choose more expensive pest-control methods, both of which could increase consumer prices for organic foods. Some organic farmers would undoubtedly turn to chemical pesticides or go out of business, potentially reducing the availability of organic products.

In 1998, CFS filed what is likely to be the first in a series of lawsuits on behalf of organic farmers and farming and environmental groups aimed at forcing the EPA to protect the future of organic farming by withdrawing its approval of GE *Bt* crops and denying future *Bt*-crop registration requests.

Chemical Dependence

Biotechnology proponents claim that crops engineered to out-compete weeds and resist diseases and insect pests will reduce chemical pesticide use. In fact, any correlation between the adoption of GE crops and levels of pesticide use is unclear, and long-term reductions seem unlikely.

Some farmers growing the first generation of *Bt* crops found that the toxin produced by the plants was not a pest-control panacea. Cotton growers in North Carolina saw stinkbugs, historically not a major threat to cotton, become problematic in their *Bt* fields. Farmers who thought they could abandon organophosphate insecticides nonetheless sprayed their *Bt* cotton fields with organophosphates to control the emergent stinkbugs.[31] An earlier scientific study had predicted this problem. In 1999, researchers found that a variety of potato engineered to resist the Colorado potato beetle effectively controlled the beetle, but opened a biological niche for aphids, which were not affected by the engineered crop and had the potential to severely damage the potato plants.[32]

A thorough analysis of the potential benefits of *Bt* crops, commissioned by the Union of Concerned Scientists, found that insecticide use by corn growers held steady from 1995 to 2000, even though the percentage of acres planted with *Bt*-corn varieties rose from 0 to 18. EPA originally reported that *Bt*-corn plantings significantly decreased pesticide use, especially for the control of the European corn borer, but subsequently backed off this claim. *Bt* cotton, on the other hand, may actually have resulted in some reduced pesticide use for the control of bollworms and budworms. This result, however, varies greatly from region to region. In Alabama, where some 60% of cotton is the *Bt* variety, pesticide use nearly doubled from 1995 to 2000. In fact, no clear pattern has emerged. Cotton is highly vulnerable to a range of insect pests, so any reductions in insecticide use due to crops engineered to resist specific pests may be ephemeral.[33]

Similarly, we cannot confidently assess the impact of herbicide-tolerant crops on the use of chemical herbicides. Early studies indicate that soybean growers planting crops engineered to tolerate glyphosate herbicides, predictably, report increased use of these types of weed killers. However, a simultaneous reduction in the use of non-glyphosates appears to have decreased net herbicide use. So far, pesticide-use data indicate that herbicide-tolerant corn and cotton varieties have had no significant effects on total herbicide use.[34] Long-term reductions in pesticide use seem even less likely.

Herbicide-tolerant GE varieties inexorably tie crop production to chemical use and provide no pathways by which farmers can migrate towards other, more environmentally sound means of weed control. As we previously discussed, gene flow, whether via cross-pollination between GE plants and weedy relatives or the spread of volunteer GE crops, will likely result in herbicide-tolerant weeds. Thus the specific herbicides associated with GE crops will become less effective. Given that the first impulse of modern agriculturalists is to fight weeds chemically, farmers will likely increase their use of other herbicides to control newly tolerant weeds.

A similar scenario could defeat insecticide-reduction strategies rooted in the use of *Bt* crops. Should important pests gain resistance to *Bt*, growers of *Bt* crops will likely turn to chemical poisons that exhibit greater toxicity and carry greater environmental risks than *Bt*. Also, with the spread of *Bt* resistance, some organic farmers would certainly feel economic pressure to give up chemical-free agriculture and turn to the use of synthetic poisons.

Soil Contamination

Scientists have discovered that *Bt* crops may contaminate the soil in which they are grown. The toxins exuded by the roots of *Bt* corn plants readily bind with clays and humic acids in the soil, protecting the toxins from degradation and allowing them to maintain their insecticidal properties for at least 234 days. Pollen produced by *Bt* crops and the decay of residual post-harvest plant matter could introduce additional amounts of *Bt* toxin into cropland soils.[35] Early research has not found *Bt* soil contamination to effect populations of soil bacteria, fungi, protozoa, nematodes, or earthworms, but additional studies are needed.[36] An immediate concern is that *Bt*-contaminated soil could hasten *Bt* resistance in insect pests.

Future generations of GE crops may produce toxins more injurious to soil biota. For example, EPA has approved experimental plantings of *Bt*-corn varieties designed to target the corn rootworm, a type of beetle.[37] These *Bt* plants will likely present greater toxicity to non-target soil biota than current *Bt*-corn varieties targeting moth larvae.

Conclusion

Despite the misleading claims of companies selling them, GE crops will not alleviate traditional environmental concerns, such as the chemical contamination of water, air, or soil. Far from eliminating pesticides, GE crops may well increase this chemical pollution. Plants engineered to tolerate herbicides closely tie crop production to increased chemical usage. Crops engineered with *Bt* genetic material to protect against specific insect pests may decrease the efficacy of this important nonchemical pesticide by increasing resistance to it. This could

Trojan Genes: GE Salmon and Species Extinction

Genetic engineering of crops does not pose biotechnology's only environmental threat. Researchers are currently manipulating the genes of a wide variety of species, ranging from bacteria to trees to livestock. Each altered organism released into the environment carries a bevy of environmental risks.

Genetically engineered fish provide an excellent, if troubling, example. Researchers worldwide are developing at least 35 species of transgenic fish, and one company, A/F Protein, has asked the FDA to allow it to market as human food salmon engineered to grow four to six times faster than normal. The commercialization of these GE fish could bring devastating environmental consequences.

Drs. William M. Muir and Richard D. Howard of Purdue University reported in 1999 that Japanese medaka fish engineered to grow faster than natural populations have a "mating advantage" if they are introduced into the wild. In Muir and Howard's experiment, 60 GE medakas introduced into a population of 60,000 wild medakas resulted in the transgene being "fixed" in the entire population after about 20 generations. Astonishingly, the scientists also found that the offspring of the GE fish were less likely to live to reproductive age in the wild. Thus, the male fish producing the least viable offspring obtained a significant mating advantage over males producing more hearty offspring. This runs counter to the evolutionary dictum "survival of the fittest;" and, indeed, Muir and Howard found that the entire population died out in about 40 generations. The researchers labeled this the "Trojan gene effect," because the apparently beneficial gene became fixed in the medaka population before eventually wiping it out. A subsequent study on GE salmon found similar results—the extinction risk increased dramatically.

A/F Protein has assured regulators that it will not allow its GE salmon to escape into the wild and that, at any rate, it will sterilize the fish, preventing them from reproducing. However, our experience with GE crops has taught us that it is all but impossible to segregate GE from non-GE varieties of commercial species. Even more worrisome, sterilization is not foolproof or enforceable, and experiments show that only a very small number of GE fish need to invade a much larger wild population for the Trojan gene to become fixed.

If we apply the Trojan gene theory to the real world, the implications are chilling. Currently, 114 species of fish are endangered, including populations of Chinook, Coho, and sockeye salmon. Other types of fish, including the Atlantic salmon, have declined dramatically in recent decades. Should a Trojan gene make its way into one of these fragile populations, complete extinction could result. Once a species is gone, we cannot bring it back—the environmental damage is irreversible.

mean the end of organic agriculture as we know it, with the conversion of this sustainable method of farming to chemical-intensive methods.

Meanwhile, genetic engineering has brought an entirely new slate of environmental concerns. Altered genes engineered into commercial plants are escaping into populations of weeds and unaltered crops. Genetically enhanced superweeds may well become a severe environmental problem in coming years. Even now, GE corn, canola and, to a lesser extent, soybeans and cotton are contaminating their non-GE counterparts. This is causing major economic concerns among farmers and is resulting in the loss of U.S. agricultural exports. The biological pollution brought by GE crops and other organisms will not dilute or degrade over time. It will reproduce and disseminate, profoundly altering ecosystems and threatening the existence of natural plant varieties and wildlife.

Despite these troubling and unprecedented environmental concerns, the U.S. government has allowed companies to grow and sell numerous genealtered crops. In the U.S., more than 76 million acres are now planted with GE varieties. Yet no government agency has thoroughly tested the impact of these crops on biodiversity or farmland and natural ecosystems. No federal agency has ever completed an Environmental Impact Statement on any GE organism, and much research into the environmental impacts of GE crops remains to be done. No regulatory structure even exists to ensure that these crops are not causing irreparable environmental harm. The FDA, our leading agency on food safety, requires no mandatory environmental or human safety testing of these crops whatsoever. Nonetheless, officials at the FDA, EPA, and USDA have allowed, and even promoted, GE crop plantings for years.

The lack of government oversight is troubling. Each decision to introduce these biological contaminants into our environment is a dangerous game of ecological roulette. The extent of irreversible environmental damage grows greater with every new acre of GE cropland and every new GE variety.

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35. Saxena, Deepak, et al., "Transgenic Plants: Insecticidal Toxin in Root Exudates From Bt Corn," Nature, 402 (1999): 480.

36. Id.

37. 64 *Federal Register*, 68,681 (Dec. 8, 1999).

In the News

Unapproved GE Canola Spreads Biological Pollution; CFS Opposes Deregulation

Monsanto and Aventis CropScience have asked the U.S. Department of Agriculture (USDA) to deregulate three varieties of herbicide-tolerant GE canola that have already contaminated some commercial canola crops. It is uncertain exactly how the unapproved varieties made their way into commercial fields. CFS informed USDA that the companies' environmental assessments for the GE plants are inadequate and petitioned the agency to reject the companies' deregulation applications. However, should USDA approve the GE varieties CFS is poised to take appropriate legal action.

National Academy of Sciences Criticizes Government's Review of GE Crops

USDA's system for reviewing the potential environmental effects of new and existing GE crops is inadequate, according to a report released in February by the National Academy of Sciences' National Research Council (NRC). The NRC takes regulators to task for shutting the public out of the review process and for relying on industry studies and trials rather than independent scientific review. The report also notes that companies typically refuse to release details about their environmental assessments, claiming these are confidential business information (CBI). This severely limits the ability of outside scientists to assess the studies. "Indeed, the committee often found it difficult to gather the information needed to write this report due to inaccessible CBI," the NRC wrote. The report calls on USDA to require independent scientific assessments of proposed GE crops and to monitor the environmental effects of crops already in commercial production.

California Considers GE Fish Legislation

A pair of bills introduced in California would ban the importation, possession, or release of live transgenic fish and would require transgenic fish sold as food (except in restaurants) to be clearly labeled. A third bill would effectively support CFS legal petitions aimed at preventing the introduction of GE fish (See "Take Action!" below) with a joint resolution urging the federal FDA to reject A/F Protein's request to sell GE salmon as food. CFS members in California should contact their state senators about bill SB1525 (ban on importation, possession, and release) and contact their assemblymen about bill AB2962 (labeling requirement) and bill AJR38 (joint resolution). Information on these bills and on how to contact your state legislators is available online at **www.sen.ca.gov** and **www.gefish.org**.

Take Action!

Protect Our Waters From GE Fish

Genetically engineered fish currently under development pose serious threats to the environment and the survival of wild fish (see the sidebar on p. 5). CFS has filed legal petitions with the FDA and four other federal agencies demanding a moratorium on the sale or importation of GE fish. The petitions also ask the government to permanently ban the release of GE fish into open waters, including net pens and ponds. **We need your help!** You can submit your comments to the FDA on this issue at the CFS web site: **www.foodsafetynow.org**. Or, you may mail comments directly to :

FDA Commissioner
FDA Dockets Management Branch (HFA-305)
Docket 01P-0230
5630 Fishers Lane, Room 1061
Rockville, MD 20852

To learn more, visit **www.gefish.org**.

Comment to USDA on GE Insect Release

CFS has successfully pressured USDA to do a full Environmental Impact Statement (EIS) on proposed field tests of the GE pink bollworm. This will be the agency's first-ever EIS on any GE organism! We also filed petitions asking for a moratorium on GE insect releases and for the agency to develop adequate protective regulations for GE insects. We encourage you to send comments supporting the CFS petitions to:

Ms. Shirley Ingebritsen, Regulatory Analyst
US Dept. of Agriculture, APHIS-PPQ-RC
4700 River Rd., Unit 141
Riverdale, MD 20737-1236
Ref: CFS Petition on GE arthropods

and **NIH Office of Biotechnology Activities**
6705 Rockledge Drive, Suite 750
Bethesda, MD 20892
Ref: Petition on GE arthropods, NIH 12/6/01

Visit **www.centerforfoodsafety.org/li.html** for more information and to read the petitions.

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